



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,598	12/12/2003	Scott Freeberg	279.441US1	1744

21186 7590 08/25/2005

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402-0938

EXAMINER

GREENE, DANA D

ART UNIT	PAPER NUMBER
----------	--------------

3762

DATE MAILED: 08/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/735,598

Applicant(s)

FREEBERG, SCOTT

Examiner

Dana D. Greene

Art Unit

3762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-20 stand rejected under 35 U.S.C. §102(b) as being anticipated by Hartley et al. (US 6,161,042, hereinafter "Hartley"). Hartley is considered to disclose:

a sensing channel for detecting intrinsic cardiac activity (see col. 2, ln. 48-65, Hartley). The disclosed channels for detecting heart activity are considered to anticipate the claimed sensing channels because both include a pair of voltage sense electrodes, which generate a voltage sense signal corresponding to a potential difference between two points in the thoracic cavity while the excitation current waveform is supplied through the excitation channel;

a pacing channel for pacing the heart (see col. 8, ln. 49-58, Hartley). The disclosed delivery channel is considered to anticipate the claimed pacing channel because both enable delivery of pacing therapy to the heart;

a controller for delivering paces in accordance with a programmed mode as modulated by a minute ventilation sensor (see col. 4, ln. 28-31 and col. 9, ln. 54-56, Hartley). The disclosed controller is considered to anticipate the claimed controller because both deliver cardiac rhythm management therapy based on the ventilation information.

Art Unit: 3762

With reference to claims 1, 12, and 13, Hartley is considered to disclose:

excitation current electrodes for imposing a current field in the thoracic cavity (see col. 10, ln. 45-55, Hartley). The disclosed electrodes are considered to anticipate the claimed electrodes because they are both used for delivering the excitation current;

exciter for supplying excitation current as an excitation current waveform at a specified excitation frequency and amplitude between the excitation current electrodes (see col. 6, ln. 19-30, Hartley). The disclosed exciter is considered to anticipate the claimed exciter because both deliver an electrical excitation signal, such as a strobed sequence of current pulses or other measurement stimuli to the heart;

a plurality of selectable voltage sense electrodes for generating a voltage sense signal corresponding to a potential difference between two points in the thoracic cavity (see col. 8, ln. 49-57, Hartley). The disclosed electrodes are considered to anticipate the claimed voltage sense electrodes because both groupings generate a voltage sense signal corresponding to a potential difference between two points in the thoracic cavity while the excitation current waveform is supplied through the excitation channel;

sampling circuitry for sampling the voltage sense signal during the excitation waveform at a specified sampling rate that corresponds to the excitation frequency (see col. 3, ln. 65 – col. 4, ln. 6 and col. 7, ln. 20-25 Hartley). The disclosed circuitry is considered to anticipate the claimed sampling circuitry because both allow the resulting signal to be regarded as a discrete-time impedance signal with each signal value representing samples of the continuous impedance signal taken at a sampling rate equal to the excitation frequency;

circuitry for demodulating and filtering the voltage sense signals samples into a ventilation band to thereby generate a ventilation signal (see col. 3, ln. 65 – col. 4, ln. 5, Hartley). The disclosed demodulator is considered to anticipate the claimed circuitry because both enable the gathering of demodulated voltage sense signal samples, which constitute samples of the impedance signal at a sampling rate equal to the strobing frequency;

circuitry for deriving a signal proportional to minute ventilation from the ventilation signal (see col. 6, ln. 30-40, Hartley). The disclosed circuitry is considered to anticipate the claimed circuitry because both are capable of deriving the minute ventilation signal from the impedance signal;

circuitry for detecting noise when no excitation current is supplied and for computing an average noise level (see col. 12, ln. 15-24, Hartley). The disclosed circuitry is considered to anticipate the claimed circuitry because both operate without the exciter and the fact that no excitation current is supplied does not affect the ability to compute the noise level;

circuitry for selecting a configuration of voltage sense electrodes for use by the device that result in the lowest average noise level (see col. 12, ln. 64 – col. 13, 3, Hartley). The disclosed circuitry anticipates the selection circuit because both filter out other noise at frequencies that exceed the low pass pole frequency.

Claims 2, 3, 5, 14, and 15 are anticipated by Hartley because this reference teaches the computing and selecting circuitry combined with a design to reduce the magnitude of the baseline component of the transthoracic impedance signal, thereby

Art Unit: 3762

increasing the relative contribution of the ventilation component of the transthoracic impedance signal, and increasing the signal-to-noise ratio (see col. 10, ln. 50-55, Hartley).

With reference to claims 8-11 and 20, Hartley is considered to disclose a device wherein the circuitry for demodulating the voltage sense signal samples generates a weighted average of the voltage sense signal samples with a filter coefficient for each sample that is positive or negative in accordance with the polarity of the excitation current waveform (see abstract, col. 3, ln. 5-15, and col. 6, ln. 17-30, Hartley). The disclosed invention teaches the demodulation of multiple phase stimuli to obtain sample points of a response signal including trans thoracic impedance information and a device with an electrical stimulation source, such as an exciter that delivers an electrical excitation signal in the form of a strobed sequence of current pulses or other measurement stimuli.

3. Claims 1 and 13 stand rejected under 35 U.S.C. §102(b) as being anticipated by Mouchawar (US 6,445,951, hereinafter "Mouchawar"). Mouchawar is considered to disclose:

excitation current electrodes for imposing a current field in the thoracic cavity; an exciter for supplying excitation current as an excitation current waveform at a specified excitation frequency and amplitudes between the excitation current electrodes (see col. 3, ln. 15-30, col. 6, ln. 25-40, and col. 7, ln. 45-50, Mouchawar). The disclosed shocking electrodes are considered to anticipate the claimed excitation current

Art Unit: 3762

electrodes because both are located within the thoracic cavity so that the voltage difference between the electrodes is measured;

a plurality of selectable voltage sense electrodes for generating a voltage sense signal corresponding to a potential difference between two points in the thoracic cavity (see col. 3, ln. 20-25, Mouchawar). The disclosed number of electrodes is considered to anticipate the claimed plurality of voltage sense electrodes because both are appropriately placed so that an impedance signal can be produced corresponding to the movement of air breathed. In this connection, a constant excitation current is made to flow between the excitation current electrodes and the voltage difference between the voltage sense electrodes in the cavity is measured;

sampling circuitry for sampling the voltage sense signal during the excitation waveform at a specified sampling rate that corresponds to the excitation frequency (see col. 10, ln. 25-35, Mouchawar). The disclosed measurement circuit is considered to anticipate the claimed sampling circuitry because sense and regard the resulting signal as a discrete-time impedance signal with each signal value representing samples of the continuous impedance signal taken at a sampling rate equal to the excitation frequency;

circuitry for demodulating and filtering the voltages sense signal samples into a ventilation band to thereby generate a ventilation signal (see col. 7, ln. 20-40, Mouchawar). The disclosed demodulator and band pass filter are considered to anticipate the claimed circuitry because both have the effect of filtering out components of the voltage sense signal due to the external fields while averaging the impedance signal component of the voltage sense signal;

circuitry for deriving a signal proportional to minute ventilation from the ventilation signal (see col. 4, ln. 60- col. 5, ln. 5, Mouchawar). The disclosed circuitry is considered to anticipate the claimed circuitry for deriving a proportional signal because both derive signals produced by demodulating and filtering the voltage sense signal samples;

circuitry for detecting noise when no excitation current is supplied and for computing an average noise level (see col. 7, ln. 40-50, Mouchawar). The disclosed circuitry is considered to anticipate the claimed noise detection circuitry because both effect a noise detection operation involving processing a voltage sense signal when no excitation current is applied so that only external field noise is picked up by the voltage sense electrodes to generate a received noise signal;

circuitry for selecting a configuration of voltage sense electrodes for use by the device that result in the lowest average noise level (see col. 7, ln. 45-55, Mouchawar). The disclosed circuitry is considered to anticipate the claimed selection circuitry because both compare the signal-to-noise ratio for the selected electrode configuration with the specified threshold value. Mouchawar anticipates the claimed invention because they both employ electrodes that result in a ratio below the threshold value to effect suspension of minute ventilation until the next configuration procedure is performed.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4, 6, 7, and 17-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Mouchawar in view of Nappholz et al. (US 5,817,136, hereinafter "Nappholz"). Mouchawar is considered to disclose the claimed invention as discussed above, under the anticipatory rejection, except for the claimed tip or ring electrode. However, Nappholz is considered to disclose this ring or tip electrode (see col. 5, ln. 60-65, Nappholz). It would have been obvious to one having ordinary skill in the art to combine the teachings of Mouchawar with the ring and tip electrodes of Nappholz for the purpose of bipolar pacing/sensing of the heart or in combination with the case or indifferent electrode for unipolar pacing/sensing.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana D. Greene whose telephone number is (571) 272-7138. The examiner can normally be reached on M-F 9-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Sykes can be reached on (571) 272-4955. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

Art Unit: 3762

you have questions on access to the Private PAIR system, contact the Electronic
Business Center (EBC) at 866-217-9197 (toll-free).



Dana D. Greene



ANGELA D. SYKES
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700